Complete Summary

GUIDELINE TITLE

ACR Appropriateness Criteria® acute chest pain - suspected aortic dissection.

BIBLIOGRAPHIC SOURCE(S)

Mammen L, Yucel EK, Khan A, Atalay MK, Haramati LB, Ho VB, Rozenshtein A, Rybicki FJ, Schoepf UJ, Stanford W, Stein B, Woodard PK, Jaff M, Expert Panel on Cardiac Imaging. ACR Appropriateness Criteria® acute chest pain--suspected aortic dissection. [online publication]. Reston (VA): American College of Radiology (ACR); 2008. 6 p. [32 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Gomes AS, Bettmann MA, Casciani T, Grollman JH, Holtzman SR, Polak JF, Sacks D, Schoepf J, Stanford W, Jaff M, Moneta GL, Expert Panel on Cardiovascular Imaging. Acute chest pain--suspected aortic dissection. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 5 p. [30 references]

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Acute chest pain
- Aortic dissection

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Cardiology
Critical Care
Emergency Medicine
Family Practice
Internal Medicine
Nuclear Medicine
Radiology
Surgery

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of initial radiologic examinations for imaging and treatment decisions for patients with acute chest pain, suspected aortic dissection

TARGET POPULATION

Patients with acute chest pain, suspected aortic dissection

INTERVENTIONS AND PRACTICES CONSIDERED

1. X-ray, chest
2. Computed tomography angiography, chest and abdomen
3. Magnetic resonance angiography, chest and abdomen
4. Ultrasound
    - Echocardiography, transesophageal
    - Echocardiography, transthoracic
5. Invasive, aortography, thoracic

MAJOR OUTCOMES CONSIDERED

Utility of radiologic examinations in differential diagnosis

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of peer-reviewed medical journals, and the major applicable articles were identified and collected.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed for reaching agreement in the formulation of the appropriateness criteria. The American College of Radiology (ACR) Appropriateness Criteria panels use a modified Delphi technique to arrive at consensus. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table

and narrative as developed by the topic leader(s). Questionnaires are completed by participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty percent agreement is considered a consensus. This modified Delphi technique enables individual, unbiased expression, is economical, easy to understand, and relatively simple to conduct.

If consensus cannot be reached by the Delphi technique, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible. If "No consensus" appears in the rating column, reasons for this decision are added to the comment sections.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria®

Clinical Condition: Acute Chest Pain—Suspected Aortic Dissection

Radiologic Procedure	Rating	Comments	RRL*
X-ray chest	9	Should be performed if readily available at the bedside and does not cause delay in obtaining a CT or MRI. Alternative causes of chest pain may	Min

Radiologic Procedure	Rating	Comments	RRL*
		be discovered. Not the definitive test for aortic dissection.	
CTA chest and abdomen	9	Recommended as the definitive test in most patients with suspicion of aortic dissection.	High
MRA chest and abdomen	8	Alternative to CTA for: contraindication to CT (iodinated contrast), multiple prior chest CTA for similar symptoms, and in patients showing no signs of hemodynamic instability. Scanner availability and local expertise limit widespread use as there is potential for delay in diagnosis. See comments regarding contrast in the text below under "Anticipated Exceptions."	None
US echocardiography transesophageal	8	If skilled operator readily available.	None
INV aortography thoracic	5		Med
US echocardiography transthoracic	4		None
Rating Scale: 1=Least appropriate, 9=Most appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

Aortic dissection typically presents with sudden onset of excruciating, tearing, anterior, or interscapular chest pain that tends to migrate to other sites along the course of the dissection. Symptoms may be dominated by dissection-related side branch obstruction or malperfusion syndrome due to aortic obstruction by the flap. Timely diagnosis of ascending aortic dissection is crucial to permit prompt surgical management, as the early mortality rates are reported to be 1% to 2% per hour after the onset of symptoms. Mortality is high in untreated aortic dissection. The overall in-hospital mortality rate for acute aortic dissection is reported to be 27%. Medical management alone of type A aortic dissections is associated with a mortality rate of nearly 20% by 24 hours after presentation, 30% by 48 hours, 40% by day 7, and 50% by 1 month. The major cause of early

death is aortic rupture. The presence of a patent false lumen has been associated with an increased risk of mortality. Classification of aortic dissection is based on the site of the intimal tear and the extent of the dissection. The clinical presentations of the different classifications of aortic dissection may be quite similar.

In DeBakey type I and type II dissection, the entrance intimal tear is located in the ascending aorta, usually just a few centimeters above the aortic valve. In type I dissection, the intimal flap extends for a variable distance beyond into the ascending aorta, while in type II the intimal flap is confined to the ascending aorta. Type III dissection originates in the descending aorta, usually just beyond the origin of the left subclavian artery and propagates antegrade into the descending aorta. Rarely, the entrance intimal tear occurs in an unusual location such as the abdominal aorta.

In the more commonly used Stanford classification, type A refers to all dissections that involve the ascending aorta, and the intimal tear may be anywhere along the course of the aorta. All other dissections are classified as type B. In type B, the dissection is confined to the aorta distal to the left subclavian artery. Approximately 60% of dissections are type A and 40% type B. The detection and localization of a proximal entry or intimal flap are crucial because patients with a type A dissection of the aorta (equivalent to types I and II of the DeBakey classification) require surgical correction. Type B dissection (or DeBakey type III) of the descending thoracic aorta is often managed medically unless the aorta is excessively dilated or there is mesenteric/limb ischemia.

Both the Stanford and DeBakey classifications are ambiguous with regard to dissections involving the descending aorta and aortic arch but not the ascending aorta proximal to the innominate artery. These are best described as type B or type III with arch involvement to provide surgeons and cardiologists with the information needed to make appropriate management decisions. Reoperations are necessary in 7% to 20% of patients with aortic dissection because of dissection-related complications.

Aortic intramural hematoma is considered a variant of classic dissection, originating from ruptured vasa vasorum in medial wall layers. This may provoke a secondary tear and communication with the aortic lumen, converting to a dissection in 28% to 47% of the patients. Intramural hematoma may extend along the aorta, progress, regress, or reabsorb. The prevalence of intramural hematoma in patients with suspected aortic dissection is in the range of 21% to 30%. Involvement of the ascending aorta is generally considered an indication for urgent surgery because of similar potential complications of a dissection in the same location. Penetrating aortic ulcers are another aortic condition properly considered separately from true aortic dissection and with a different pathophysiology (the disruption in the aortic wall originates in an atherosclerotic plaque) and epidemiology (patients tend to be older, with extensive aortic atherosclerosis and a lesser degree of hypertension). Intramural hematoma and/or intimal flap, if present, tend to be over a much shorter distance than in true aortic dissection.

Imaging studies in the evaluation of suspected thoracic dissection should be directed toward confirmation of the presence of dissection; classifying the

dissection as type A or B; assessment of entry and reentry sites; identification of patency of the false lumen; assessment of aortic valve competency; detection of the presence or absence of aortic branch involvement, including involvement of the coronary ostia; and determination of the presence of extravasated blood into mediastinal, pleural, or pericardial spaces. In addition, imaging should help distinguish classic aortic dissection from other causes of "acute aortic syndrome" such as acute intramural hematoma and penetrating atherosclerotic ulcer.

Radiography

A chest radiograph is recommended in all patients presenting with acute chest pain, including those suspected of having aortic dissection. Almost 20% of patients with dissection may have negative chest x-ray findings. Therefore, further imaging should be pursued despite a normal chest x-ray in cases of suspected aortic dissection. In most cases of dissection, the positive findings on a chest radiograph are nonspecific, and when studied in conjunction with the clinical history, can be significant and provide supporting evidence for dissection. Widening of the superior mediastinum may be present, but difficult to evaluate with portable radiography. Displacement of aortic wall calcification is a finding of limited value and may be misleading. The primary role of chest radiography is to rule out other thoracic pathology.

Computed Tomography

Computed tomography (CT) with contrast injection is indicated in the diagnosis of aortic dissection. CT was the most common initial diagnostic test performed in the patients enrolled in the International Registry of Acute Aortic Dissection. CT is minimally invasive, faster, safer, cheaper, and less resource intensive than catheter aortography. Most larger hospitals now have in-house CT technologists available 24 hours a day for emergency studies. CT angiography (CTA) affords high quality thin axial sections that demonstrate intimal flaps, aortic atherosclerotic plaque, branch vessel involvement, patency of the false lumen, extravascular pathologic conditions that may cause mediastinal widening or chest symptoms, and spatial relationships and status of adjacent organs and pericardial and pleural spaces. Precontrast images are recommended for identification of calcification and intramural hematoma. A significant advantage of CT is that alternative causes of chest pain have been reported in up to 21% of cases scanned for suspected aortic dissection. Factors reducing the diagnostic accuracy of CTA are poor opacification of the aorta due to inadequate contrast injection or improper bolus timing, failure to identify the intimal flap because of motion artifacts, and misinterpretation of streak artifacts or motion artifacts as an intimal flap. When the false lumen does not opacify, differentiation between a thrombus-filled atherosclerotic aneurysm, thrombosed dissection, or intramural hematoma may be difficult. Other limitations of CT include the need for administration of iodinated contrast material and inability to detect aortic insufficiency.

Numerous studies evaluating the efficacy of CT in diagnosing aortic dissection have demonstrated sensitivity of 90-100%, but lower specificities ranging from 87% (lower than magnetic resonance angiography [MRA] or transesophageal echocardiography [TEE]) to 100%. However these studies compared conventional CT, which has largely been supplanted by faster multidetector helical CT (MDCT) or less commonly electron beam CT (EBCT). More recent MDCT studies enrolling

up to 57 patients have reported sensitivities and specificities of 100%. The newer generation helical CT scanners with multidetector technology represent a significant advance in CT imaging. The use of multidetector arrays allows accurate imaging of a large anatomic area with high resolution and a short acquisition time. It permits breath-hold volumetric acquisitions, eliminating ventilatory misregistration. Narrow collimation results in improved resolution with improved visualization of vascular structures as compared with conventional CT. With shorter imaging times, better bolus tracking is accomplished and more images are obtained during peak contrast enhancement, resulting in improved visualization of vascular structures as compared with conventional CT. CTA provides exquisite detail on the intimal flap and branch vessel involvement. Motion artifacts in the ascending aorta mimicking dissection are much less of a clinical problem with MDCT with cardiac gating.

The rapid, large-volume acquisition that can be obtained with MDCT allows imaging of both the thoracic and abdominal components of the dissection and assessment of extension of the dissection into abdominal and pelvic branch vessels with one injection of a reasonable volume of contrast. Image post processing of the volumetric data using multiplanar reformatting and 3D volume rendering of the data set facilitate evaluation of the course of the intimal flap. Recent studies show similar sensitivities for CTA, TEE, and MRI in detecting aortic dissection. Evaluation of the relative accuracy of these modalities is confounded by the fact that technical improvements in CT, MR, and TEE have outpaced our ability to perform necessary trials. To date, there have been no large studies comparing MDCT, MRI and TEE.

Magnetic Resonance Angiography (MRA)

MRA allows the noninvasive visualization of the thoracic and abdominal aorta in multiple projections without the use of ionizing radiation. Patients can also be imaged without the use of contrast agents if they are contraindicated. A variety of pulse sequences are available. Electrocardiogram (ECG)-triggered black-blood or white-blood images provide exquisite anatomic detail of the heart and aorta. Cine MRI and other fast-gradient-echo techniques allow visualization of flowing blood, facilitating the differentiation of slow flowing blood and clot, and determination of the presence of aortic insufficiency. The true and false lumen and intimal flap are readily identified. Functional cardiac information such as aortic regurgitation and left ventricular function can be assessed. Newer gadolinium-contrast-enhanced 3D MRA (CE-MRA) techniques permit rapid acquisition of MR angiograms of the thoracic and abdominal aorta and their branch vessels. These techniques allow coverage of large volumes with and without breath holding. The 3D data sets may be reconstructed. 3D CE-MRA permits easy identification of both the true and false lumen and enables identification of the type of dissection and assessment of patency of the false lumen.

MRI is considered a very accurate technique for diagnosing aortic dissection. Both the sensitivity and specificity of MRI for diagnosing aortic dissection have recently been reported to be 100%. For identifying the site of entry, sensitivity was 85% and specificity 100%, and for identifying thrombus and the presence of a pericardial effusion, sensitivity and specificity were both 100%. Excellent sensitivity (92% to 96%) and specificity (100%) have been documented for CE-MRA in acute and chronic aortic dissection. Limitations of MRI are longer

examination times compared with MDCT, and more limited scanner availability on an emergency basis. Monitoring and treatment of very ill patients are also more difficult in the MRI environment compared with CT. Faster MRI techniques are being explored, and as the newer generations of faster scanners are developed, the feasibility of scanning these patients emergently is expected to improve. Further, patients with cardiac pacemakers, ferromagnetic aneurysm clips, and other MRI incompatible devices cannot undergo MRI, and contrast cannot be used in patients with severe renal insufficiency. Studies in uncooperative patients and patients who are unable to hold their breath can result in nondiagnostic images. The use of cardiac gating may be limited in the presence of cardiac arrhythmias.

Echocardiography

In the diagnosis of aortic dissection, echocardiography has the advantage of being readily available and easily performed at the bedside in hemodynamically unstable patients. Transthoracic echocardiography (TTE) has been found to have a sensitivity of 59-85% and a specificity of 93% to 96%. It is useful in the diagnosis of dissection involving the ascending aorta and can diagnose the hemodynamic significance of pericardial effusions, the degree of aortic regurgitation, and left ventricular function. TTE is of limited value in diagnosing distal dissections, limited by the availability of ultrasound windows.

TEE overcomes many of these limitations and can image almost the entire thoracic aorta, sometimes with limitation in the distal ascending aorta and arch vessels. TEE is also useful for detecting coronary artery involvement with the dissection. It has sensitivity similar to that of MRI and CT for detecting dissection. With single-plane units the sensitivity of both TTE and TEE is lower than that of CT and MRI, mainly as a result of false positive findings in the ascending aorta. The sensitivity and specificity of monoplane and biplane TEE range from 90-100% and specificity from 77% to 100%. The accuracy of TTE in descending aortic dissections is considerably lower, with sensitivities reported at 80%.

Multiplanar TEE can provide accurate diagnosis of aortic dissection with a sensitivity of 99% and specificity of 98%. The additional views provided by multiplanar TEE considerably reduce the blind spot of monoplanar TEE, leaving only a small portion between the ascending aorta and proximal aortic arch that is suboptimally shown. However, even with multiplane units, diagnostic problems are encountered in the ascending aorta where reverberation artifacts can result in false positive diagnosis of dissection. Principal limitations of TEE are its dependence on a high degree of operator skills, and blind areas in the distal ascending aorta and proximal transverse arch which are obscured by the air-containing trachea and left main bronchus. Additional limitations are the inability to reproducibly document pathologic findings as a baseline for comparison with follow-up studies and the inability to visualize the distal extent of the dissection in the abdomen. Nonetheless, in most cases of acute dissection, TEE provides immediate, sufficient information for the decision about whether to perform surgery, obviating the need for angiography, and is indicated. Several studies comparing TEE with aortography and CT found TEE superior. However, these studies were done with older-generation CT scanners. In descending aortic dissection, angiography, CT, and MRI are preferable, because they allow evaluation of branch vessel involvement and assessment of the distal extension of the dissection.

Angiography

Angiography has historically been considered the gold standard for diagnosing aortic dissection. The sensitivity of angiography has been found to be 88% and the specificity 94%, with positive and negative predictive values of 96% and 84%, respectively.

The diagnostic accuracy of digital subtraction angiography approaches 98% in some series. Angiography permits management of critically ill patients, and aortic regurgitation and aortic branch vessel involvement can be assessed. High frame rates facilitate identification of the intimal tear and the degree of aortic insufficiency. Cineangiography has been used, but the field of view is usually limited. False negative arteriograms may occur when the false lumen is not opacified, when there is simultaneous opacification of the true and false lumen, and when the intimal flap is not displayed in profile.

Disadvantages of angiography are that it is invasive, iodinated contrast material is required, and there is typically a delay in implementing the procedure. Although angiography provides good visualization of the thoracic and abdominal branch vessels and flow patterns, it is now rarely used as the evaluation and management of aortic dissection except where definitive coronary evaluation is required. In recent years, it has been replaced by minimally invasive TEE and noninvasive CT and MRI.

Summary

Current experience suggests that the accuracies of TEE with a skilled operator and reader, MDCT, and MRI will be very similar. Because patients with acute dissection are critically ill and potentially in need of emergency operation, the selection of a given modality will depend on clinical circumstances and availability. CTA is likely to be more rapidly available on a 24-hour basis and is associated with less patient discomfort. It can provide information on branch vessel involvement and ancillary significant findings and has the advantage of evaluating the aorta and branch vessels in their entirety. Although it does not provide information regarding aortic insufficiency and may not detect coronary artery involvement, this information can be obtained with TTE or TEE while the operating room is being prepared. In selected centers where experienced cardiologists are readily available to perform state-of-the-art TEE in the emergency room, TEE may be the preferred first-line imaging because it can provide sufficient information to determine whether emergency surgery is needed.

When information about branch vessel involvement is required by the surgeon and not provided by CTA (a rare occurrence with MDCT units), angiography may be useful. Coronary angiography may still be required if definitive preoperative coronary evaluation is needed. MRA may be sufficient to replace angiography in stable patients and those with chronic dissection or uncertain diagnoses. In selected centers, MRAs may readily be offered as the first line of imaging on an emergent basis. Faster imaging sequences may extend its use to less stable patients. Image postprocessing of CT and MRI data using multiplanar image reformatting and 3D volume rendering may provide additional useful information for treatment planning.

Anticipated Exceptions

Nephrogenic systemic fibrosis (NSF, also known as nephrogenic fibrosing dermopathy) was first identified in 1997 and has recently generated substantial concern among radiologists, referring doctors and lay people. Until the last few years, gadolinium-based MR contrast agents were widely believed to be almost universally well tolerated, extremely safe and non-nephrotoxic, even when used in patients with impaired renal function. All available experience suggests that these agents remain generally very safe, but recently some patients with renal failure who have been exposed to gadolinium contrast agents (the percentage is unclear) have developed NSF, a syndrome that can be fatal. Further studies are necessary to determine what the exact relationships are between gadolinium-containing contrast agents, their specific components and stoichiometry, patient renal function and NSF. Current theory links the development of NSF to the administration of relatively high doses (e.g., >0.2mM/kg) and to agents in which the gadolinium is least strongly chelated. The U.S. Food and Drug Administration (FDA) has recently issued a "black box" warning concerning these contrast agents (http://www.fda.gov/cder/drug/InfoSheets/HCP/gcca_200705HCP.pdf).

This warning recommends that, until further information is available, gadolinium contrast agents should not be administered to patients with either acute or significant chronic kidney disease (estimated glomerular filtration rate [GFR] <30 mL/min/1.73m^2), recent liver or kidney transplant or hepatorenal syndrome, unless a risk-benefit assessment suggests that the benefit of administration in the particular patient clearly outweighs the potential risk(s).

Abbreviation

- CT, computed tomography
- CTA, computed tomography angiography
- INV, invasive
- Med, medium
- Min, minimal
- MRA, magnetic resonance angiography
- MRI, magnetic resonance imaging
- US, ultrasound

Relative Radiation Level	Effective Dose Estimated Range
None	0
Minimal	<0.1 mSv
Low	0.1-1 mSv
Medium	1-10 mSv
High	10-100 mSv

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Selection of appropriate radiologic imaging procedures for rapid and accurate diagnosis of aortic dissection

POTENTIAL HARMS

- Transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), and cineangiography can render false-positive results.
- Recently some patients with renal failure who have been exposed to gadolinium contrast agents (the percentage is unclear) have developed nephrogenic systemic fibrosis (NSF), a syndrome that can be fatal. The U.S. Food and Drug Administration (FDA) has recently issued a "black box" warning concerning these contrast agents. This warning recommends that, until further information is available, gadolinium contrast agents should not be administered to patients with either acute or significant chronic kidney disease (estimated glomerular filtration rate [GFR] <30 mL/min/1.73m^2), recent liver or kidney transplant or hepatorenal syndrome, unless a risk-benefit assessment suggests that the benefit of administration in the particular patient clearly outweighs the potential risk(s).

Relative Radiation Level (RRL)

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Additional information regarding radiation dose assessment for imaging examinations can be found in the American College of Radiology (ACR) Appropriateness Criteria® Radiation Dose Assessment Introduction document (see "Availability of Companion Documents" field).

CONTRAINDICATIONS

CONTRAINDICATIONS

Patients with cardiac pacemakers, ferromagnetic aneurysm clips, and other magnetic resonance imaging (MRI) incompatible devices cannot undergo MRI, and contrast cannot be used in patients with severe renal insufficiency.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Mammen L, Yucel EK, Khan A, Atalay MK, Haramati LB, Ho VB, Rozenshtein A, Rybicki FJ, Schoepf UJ, Stanford W, Stein B, Woodard PK, Jaff M, Expert Panel on Cardiac Imaging. ACR Appropriateness Criteria® acute chest pain--suspected aortic dissection. [online publication]. Reston (VA): American College of Radiology (ACR); 2008. 6 p. [32 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1998 (revised 2008)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

GUIDELINE COMMITTEE

Committee on Appropriateness Criteria, Expert Panel on Cardiac Imaging

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Leena Mammen, MD; E. Kent Yucel, MD; Arfa Khan, MD; Michael K. Atalay, MD, PhD; Linda B. Haramati, MD; Vincent B. Ho, MD, MBA; Anna Rozenshtein, MD; Frank J. Rybicki, MD, PhD; U. Joseph Schoepf, MD; William Stanford, MD; Barry Stein, MD; Pamela K. Woodard, MD; Michael Jaff, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Gomes AS, Bettmann MA, Casciani T, Grollman JH, Holtzman SR, Polak JF, Sacks D, Schoepf J, Stanford W, Jaff M, Moneta GL, Expert Panel on Cardiovascular Imaging. Acute chest pain--suspected aortic dissection. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 5 p. [30 references]

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

ACR Appropriateness Criteria® *Anytime*, *Anywhere*™ (PDA application). Available from the ACR Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- ACR Appropriateness Criteria®. Background and development. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.
- ACR Appropriateness Criteria® radiation dose assessment introduction. American College of Radiology. 2 p. Electronic copies: Available from the ACR Web site.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on October 26, 2000. The information was verified by the guideline developer on December 14, 2000. This summary was updated by ECRI on February 9, 2006. This summary was updated by ECRI Institute on May 17, 2007 following the U.S. Food and Drug Administration (FDA) advisory on Gadolinium-based contrast agents. This summary was updated by ECRI Institute on June 20, 2007 following the U.S. Food and Drug Administration (FDA) advisory on gadolinium-based contrast agents. This summary was updated by ECRI Institute on June 15, 2009.

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Date Modified: 7/27/2009